

No 68

7th and Walnut

An A very good Essay -
Essay Passed March 21st 1824

on the
Medical Properties
and
Active Principle
of the
Callicocca Specacuanha.

By
Joseph Lee
of
Camden
South Carolina.

1825.

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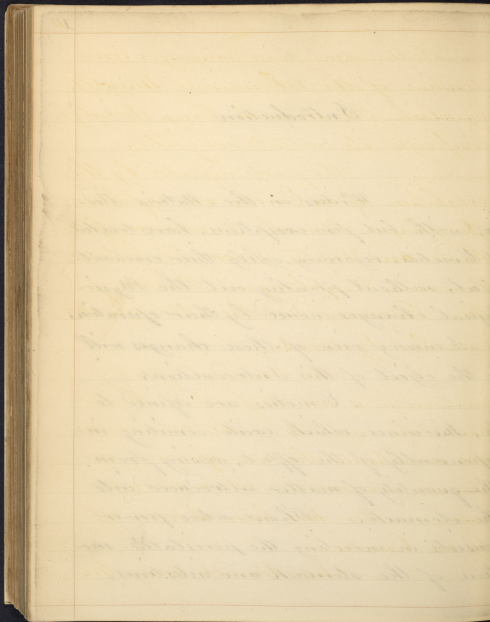
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Introduction

Writers on the Materia Medica, with but few exceptions, have treated of Emetics, regarding solely their evacuant effect, without pointing out the Physiological changes induced by their operations.

A cursory view of these changes will be the object of this Introduction.

Emetics are defined to be; Medicines, which excite vomiting independently of the effect, arising from the quantity of matter introduced into the stomach. Their active power consists in inverting the peristaltic motion of the stomach and intestines,

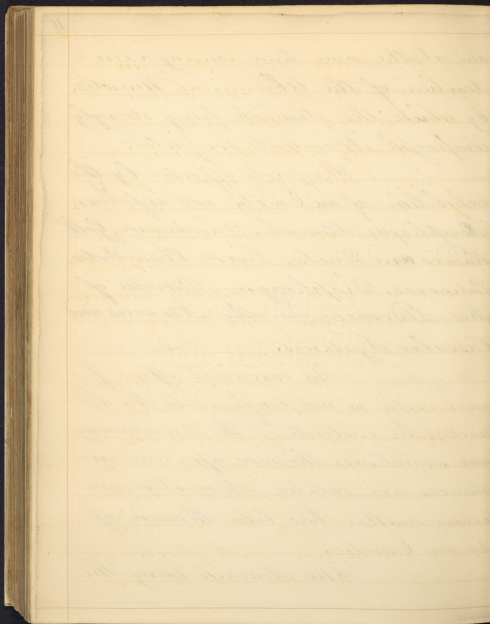


and at the same time causing a contraction of the Abdominal Muscles, by which the stomach being strongly compressed its contents are ejected.

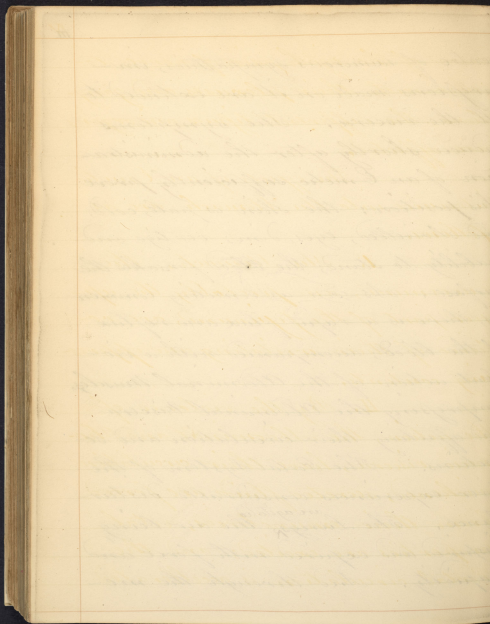
The parts affected by the exhibition of an Emetic are as follows; Esophagus, Stomach, Duodenum, Gall-bladder and Ducts, Liver, Vena Portae, Pancreas, Diaphragm, Parietes of the Abdomen, and the Nervous and Vascular Systems.

The evacuant effect of an Emetic is not confined to the Stomach, the contents of the Duodenum are sometimes thrown up; and instances are related where stercoraceous matter has been thrown off by an Emetic.

The Stomach being the



centre of numerous sympathies, im-
 pressions made on it, are extended to
 all the viscera. The symptoms
 induced shortly after the administra-
 tion of an Emetic sufficiently prove
 this position: the skin is pale, cold,
 and shrivelled; eyes, dim; vertigo and
 inability to stand; the blood forsakes the
 surface. As soon as vomiting commen-
 ces, there is a rapid flux and reflux
 of the blood; accompanied with a vio-
 lent action of the Abdominal Muscles,
 compressing the Abdominal viscera
 and affecting their circulation and se-
 cretions. The Portal System of the
 Liver experiences considerable distur-
 bance. The Lungs^{are agitated}, the air being
 inspired and expired with force and
 rapidity. And through the me-

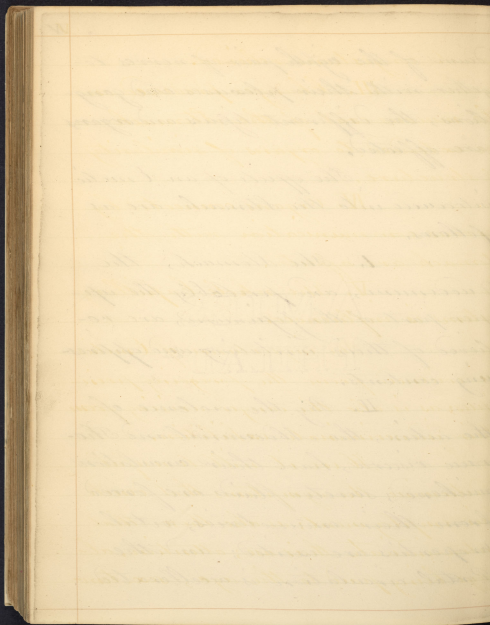


trum of the eighth pair of nerves together with their plexuses and ganglions, the different tissues and organs are affected.

The effects of an Emetic introduced into the Stomach are as follows.

I. The Stomach, the Duodenum, and probably the upper part of the Jejunum, are relieved of their irritating and oppressing contents.

II. By the violence of the action, the Abdominal and Thoracic viscera, have their circulation quickened; secreted fluids are forced from their excretories; vital properties are excited; and the Portal circulation is accelerated.



V
and its congestions relieved.

III. Changes produced on the mucous coat of the Stomach are extended to organs of similarity of structure.

IV. Organs connected by nervous communication with the Stomach are affected.

V. The whole Capillary system is influenced.

The importance of Emetics are evidenced from the foregoing principles; as is also the danger arising from their indiscriminate exhibition.

Here it will be useful to determine the symptoms that denote their employment; as also those that contra-indicate their use; attention, always being paid to the age, sex, tem-

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perament, and nervous sensibility, of the patient.

Emetics are indicated, by nausea, tongue loaded with fur, giving to the touch a sensation of plasticity, taste bitter, breath foetid, disagreeable eructations, a sense of fullness, approaching to painful distention of the epigastric region, cardialgia, headache, anxiety referred to the cardiac orifice of the Stomach, loathing, total deprivation of appetite &c.

But if superadded to the above symptoms; we have a tumid Abdomen, constipation, or the purging of dark or greenish matters, flatulence, weight and uneasiness in the lumbar regions, pains in the

lower extremities, &c. we may infer that the stomach is not the seat of irritation; and we shall find purgatives to answer best,

The circumstances, or symptoms, which contra-indicate the use of Emetics are as follows; viz. general plethora, acute inflammation, especially of the stomach, diaphragm and liver; advanced stage of fevers, or in their commencement, when accompanied by violent pain in the epigastrium, dry tongue, with deep fissures; also in extensive wounds; hæmorrhagies from a solution of continuity, hernia, prolapsus uteri, advanced stage of pregnancy, scirrhus or carcinomatous tumours of the Abdomen, and in some cases of Phthisis.

When the exhibition of an Emetic is determined on; if the patient be plethoric, or if there be a determination to the head, it will be proper to premise venæsection. If the indication be simply to evacuate the stomach; the exhibition of an Emetic should be accompanied with diluent drinks, as by this means the indication is fulfilled with less effort on the part of the patient. But, if it be required to make a strong impression on the system, drinks should be withheld for a time.

By common consent morning is esteemed the best time for the exhibition of an Emetic; but it may be given at any time if necessary.

When vomiting is excessive it may be checked by carbonated waters, effervescing mixtures, laudanum, anæsthetic injections, or by sinapisms applied to the epigastric region and to the extremities,

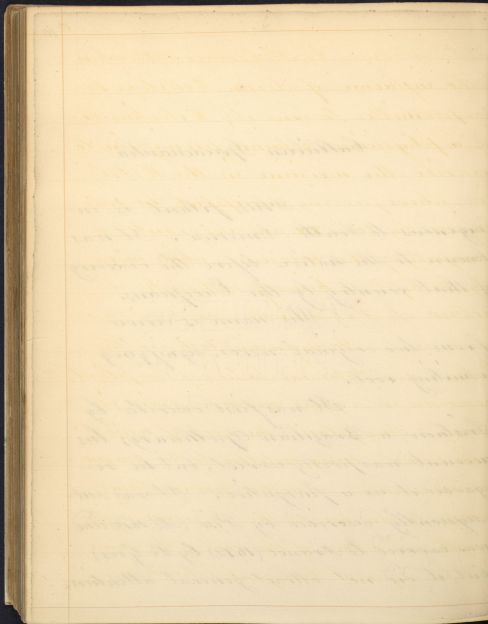
Calliceca Spicaeantha.

Callicocca Specacuantha

This plant is indigenous to South America. It was known to the natives before the discovery of that country by the Europeans.

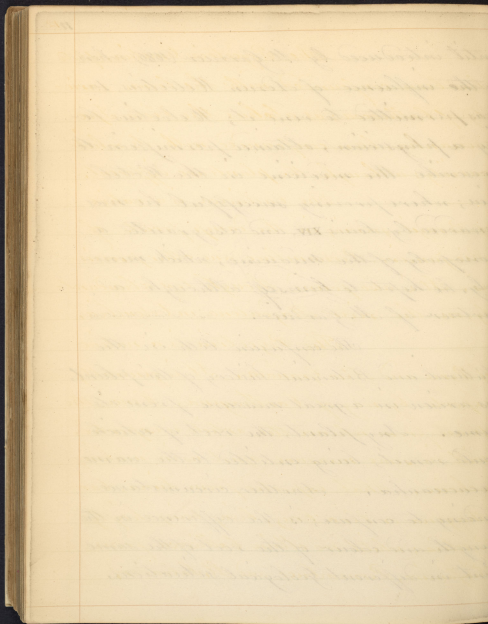
The name is derived from two original words, signifying vomiting-root.

It was first described by Tristano, a Brazilian Apothecary; his account was pretty correct, but he regarded it as a purgative. It was subsequently described by Piso (A.D. 1618) and was carried to France (1612) by Le Gros; but, it did not attract general attention.



until introduced by M. Garnier (1686) when
 by the influence of Lerin Helvetius, he
 was permitted to vend it; Helvetius be-
 ing a physician, obtained permission to
 prescribe the medicine in the Hotel
 Dieu; where proving successful he was
 rewarded by Louis XIV, and also granted a
 monopoly of the medicine, which mono-
 poly, he kept to himself although a
 partner of M. Garnier. *Hist. des Savins, French 1707*

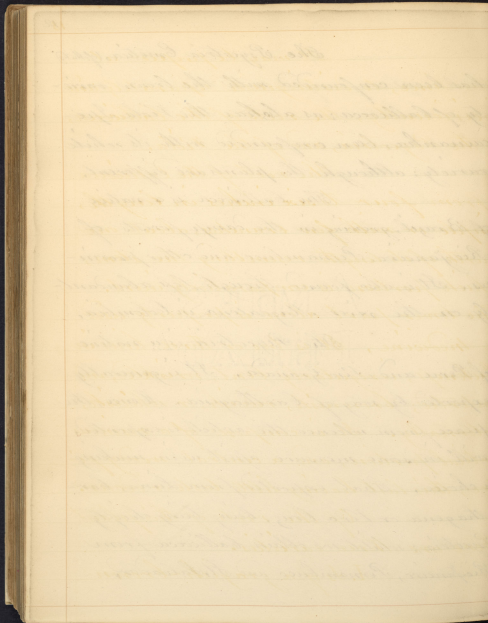
The confusion both in the
 Natural and Botanical history of this plant,
 has arisen in a great measure from its
 name. Any plant, the root of which
 would vomit, being entitled to the name
specacuanha. Another circumstance
 tending to confuse, is the difference in the
 strength and colour of the root of the same
 plant in different Geological situations.



The *Pyrotia Emetica*, (Gibb.)
 had been confounded with the brown variety
 of *Callicocca*; as also has the *Viola Spe-*
vacuantha, been confounded with its white
 variety; although the plants are different.

The *Callicocca* is a native
 of Brazil, growing in the damp forests of
 Rio-Janeiro, Pernambuco and other provin-
 ces. It is also found though less abundant-
 ly, on the river Magdalena in Colombia.

The *Pyrotia* is a native
 of Peru and New Granada. It is generally
 exported by way of Carthagena. Hence, the
 place from whence the article is exported,
 will in some measure assist us in making
 a choice. That exported from Lima, Car-
 thagena or Vera Cruz, being chiefly
Pyrotia; whilst we obtain *Callicocca* from
 Rio-Janeiro, Pernambuco and St. Salvador.



It may be proper at this time, to distinguish separately and individually, the roots of the *Callicocca*, of the *Boycotria*, and of the *Viola*.

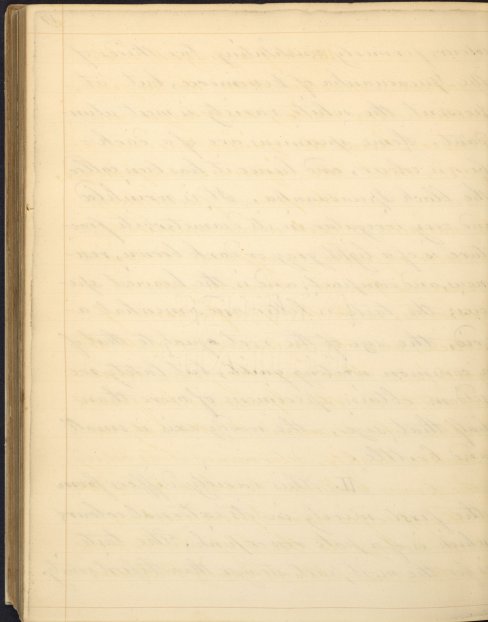
The root of the *Callicocca* is from four to six inches in length, simple or with few branches, about one fourth of its length resembling the stem, which portion is comparatively inert. The lower part alone is properly used in medicine. It is two or three lines in thickness, irregularly bent, wrinkled, and contorted; brownish, reddish, or whitish, externally. It is composed of a resinous cortical portion, and a central woody fibre, this last having little taste or odour.

Of the roots of this plant there are three varieties.

I. Is of a grayish-brown

colour, formerly constituting two thirds of the *Specacuantha* of commerce, but at present the white variety is most abundant. Some specimens are of a dark-brown colour, and hence it has been called the black *Specacuantha*. It is wrinkled and very irregular in its diameter; its fracture is of a light gray or dark brown, resinous, and compact; and is the heaviest species; the taste is bitter and somewhat acriid, the size of the root equal to that of a common writing quill, but lately we seldom obtain specimens of more than half that size, - the woody axis is small and brittle.

II. This variety differs from the first merely in its external colour, which is of a pale rose or pink. The taste is for the most part stronger than the first variety.



III, Is of a grayish white appearance, smoother than the two first, fracture very white, root larger and stronger, hence the opinion has been adopted, that the differences arose from age.

The plant furnishing the varieties of roots above enumerated, has been referred, by different Botanists to various Genera. Persoon called it a *Cephaelis*, with the specific name of *Emetica*, and also confounded it with the *Boycotria*. Piso and Margrave considered it to be the *Specacuanka-fusca*. Brotero, who examined it attentively in its native locality, determined it to belong to the Genus *Callicocca* to which he has added the specific name *Specacuanka*, which belongs to the Class *Pentandria* Order *Monogynia*, Natural Family *Rubiaceae*.

The *Pyrotia Emetica* is a plant of the same Class, Order, and Natural Family with the *Callicocca*, and by Persoon was confounded with it.

The root is fusiform, branching, articulated, and covered with capillary fibrils. Distinguished from the roots of the black or brown variety of *Callicocca*, by being smoother and marked with longitudinal striae, interrupted at considerable distances by divisions penetrating to the woody axis, the fracture is of a grayish black, more striking when moistened, resinous but less compact than the *Callicocca*. The taste is feeble, scarcely at all bitter, and it is only after chewing for some time that a slight peppery taste is left in the mouth.

The following is a list of the

names of the persons who have

been admitted to the office of

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Another South American plant, the root of which is sometimes confounded with the roots of the *Callicocca*, is the *Vida Specacuanha* of Mutis.

The root of this plant is of a grayish white colour externally; in size as large as a pigeons quill, and covered with projections, which for the most part are only semicircular; fracture very white, starchy and devoid of resin, the woody axis sometimes thicker than the cortical portion. Like the *Pyrotia*, and unlike the *Callicocca*, it has little or no taste. It is too feeble to be relied on and should be rejected.

The roots of the *Callicocca* are becoming scarce. The plant is annual the root perennial. As it is generally gathered before the seed ripens, the

whole plant is destroyed; and it is stated that an extinction of the Species is threatened. Even now it cannot be procured of a good quality except in the virgin forests.

As before stated the first authentic account of the *Callicocca*, represented it as a purgative. It was first introduced as a remedy in Dysentery; given either in such a dose as would excite full vomiting, or, in doses of two or three grains, until vomiting, diaphoresis, or purging was induced.

Maret, reports an experiment made on twenty patients; the result of which, as it characterizes the medicine, we will here relate. The whole quantity of the *Callicocca Specacuanha* that was exhibited was six drachms. In eighteen cases vomiting was induced.

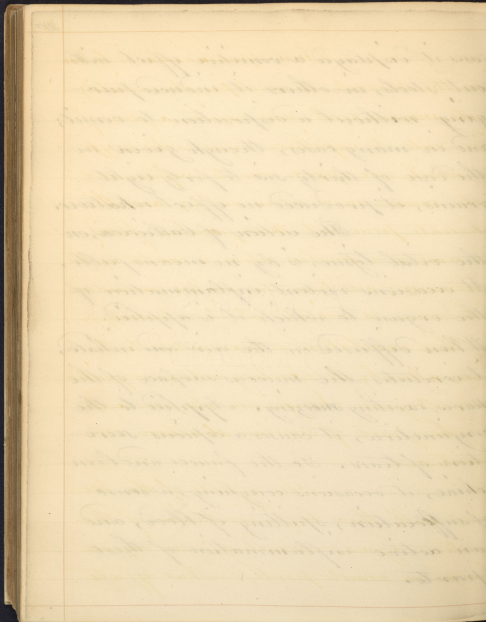
one of those whom the medicine did not
 vomit, was a man with Diarrhoea; the
 other was a child to whom four grains
 had been administered. The whole
 number of vomitings were fifty. The
 whole number of Alvine evacuations
 were one hundred. Irregularity atten-
 ded its action. In the case of a man
 aged fifty-eight, with Dysentary, there
 was but one vomiting to fifteen stools,
 but in others there were three or
 four vomitings without a stool; the
 quantity exhibited to each of these pa-
 tients was eighteen grains. There
 were but three cases in which the
 medicine did not produce at least
 one Alvine evacuation.

A similar experiment
 was made with the *Pyrotia*. In some

cases it displayed a vomitive effect without stools, in others it induced purging without a disposition to vomit; and in many cases, though given in the dose of thirty-six to forty eight grains, it produced no effect whatever.

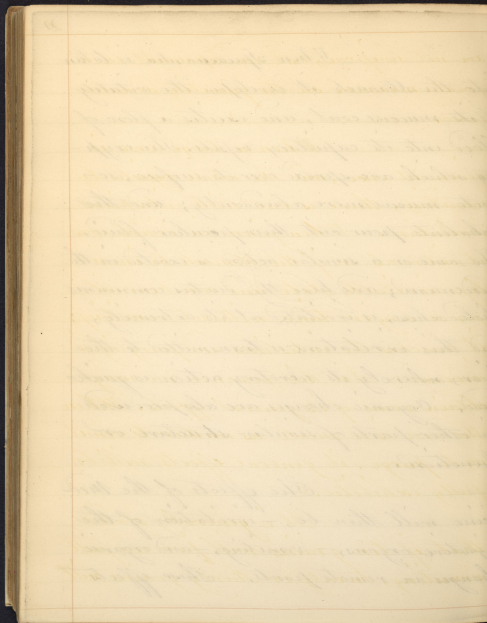
The action of *Callicocca*, on the vital tissue, is by no means feeble. It occasions violent inflammation of the organ to which it is applied.

When diffused in the air and inhaled, it irritates the mucous surface of the Nares, exciting sneezing. Applied to the conjunctiva, it causes a copious secretion of tears. To the fauces and bronchiae, it occasions coughing, a sense of suffocation, spitting of blood, and an active inflammation of those parts.



When Spicacuanha is taken into the Stomach it develops the vitality of its mucous coat, and excites a flow of blood into its capillary vessels. The cryptae which are spread over its surface, secrete mucus more abundantly; and the exhalents pour out their peculiar fluid. The same or a similar action is excited in the Duodenum; and here the ductus communis choledochus, is irritated at its extremity, and this irritation is transmitted to the liver; whereby its secretory action is quickened. Organic changes are also produced in other parts of similar structure or function.

The effects of the Medicine will then be, — irritation of the digestive organs, — vomiting, — and organic changes in remote parts. These effects



are not uniform, but are dependant in a great measure on the quantity administered.

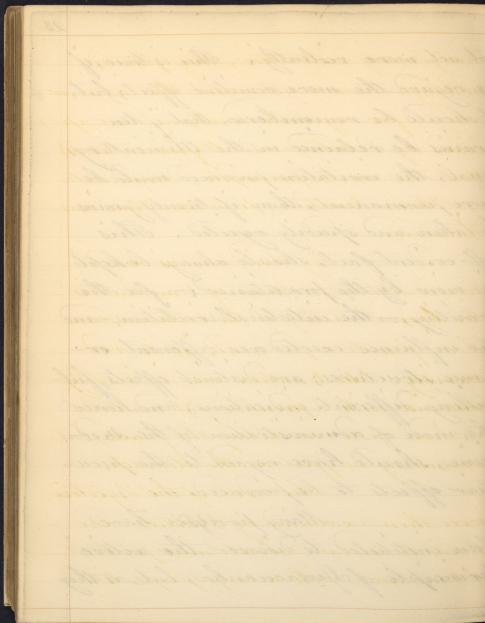
When a large dose is given at once, and the whole rejected by vomiting, there is but little intestinal irritation. When given in divided doses at intervals, or, if the Stomach be in a less irritable state and can bear it for a longer time without vomiting; it reaches the intestines and purging is induced. In this manner we may obtain some of its general effects. When the dose is so small as neither to vomit or to purge, its general effects will be fully exhibited.

It is generally stated that if ten grains will produce full vomiting, twenty or thirty grains will

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not act more violently. This is true, if we regard the mere vomitive effect; but, it should be remembered, that if ten grains be retained in the alimentary canal, the irritation produced would be more permanent, than if twenty grains be taken and speedily rejected. This self-evident fact, should always be kept in view by the practitioner; - for the vomiting, - the intestinal irritation, - and the influence exerted over different organic structures; are distinct effects, fulfilling different indications; and hence the mode of administration of the medicine, should have regard to the peculiar effects to be produced.

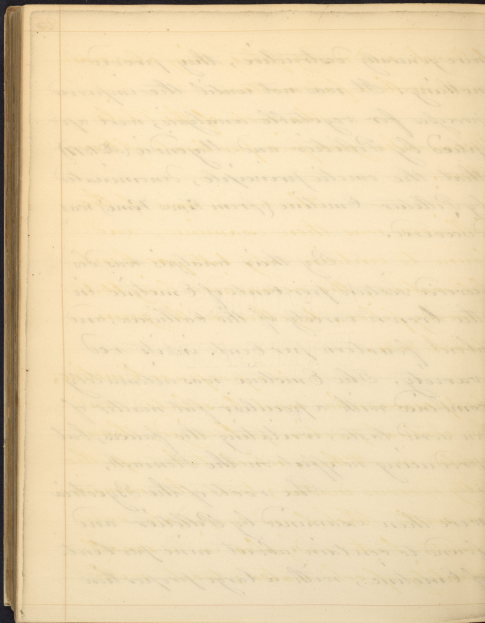
Many processes have been instituted to discover the active principle of *Specacuanha*, but, as they



were generally destructive, they proved nothing. It was not until the improved processes for vegetable analysis, were applied by Pelletier and Magendie (1817) that the emetic principle, denominated by Pelletier Emetine (from Eperu Temo) was discovered.

By their analysis was discovered sixteen per cent. of Emetine in the brown variety of the Callicoca, and about fourteen per cent. in its red variety. The Emetine was intimately combined with a peculiar fat matter of an acrid taste, irritating the fauces, but producing no effect on the Stomach.

The roots of the Bycotria were then examined by Pelletier and found to contain about nine per cent. of Emetine, with a large proportion



of Starch and woody fibre, being also combined with a fat matter.

The roots of the *Viola* *Specacuanha* gave five per Cent. of Emetine.

The woody axis of the *Callicocca* was then examined, and found to contain only 1.15 per Cent. of Emetine, the remainder being 66.60 of woody fibre, together with gum, starch &c.

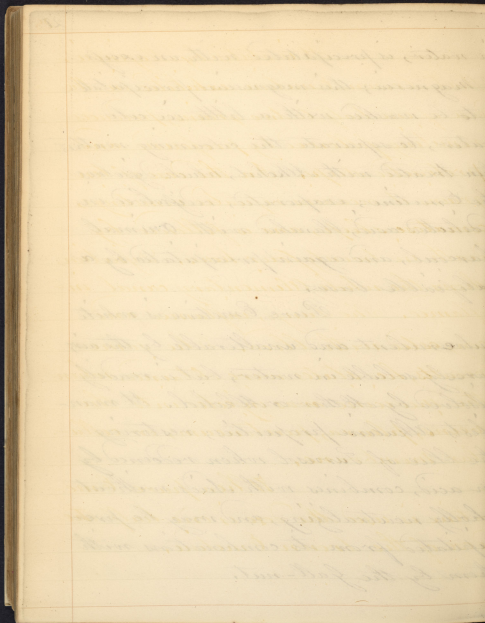
To prepare Emetine; The *Specacuanha* must be selected, and the cortical portion pulverized; then digested in Ether, which takes up the fatty odorous matter; treat the remainder with Alcohol and evaporate over a water bath; redissolve in a small quantity of cold water; treat with

Carbonate of Magnesia, to free it from a trace of free Gallic acid; evaporate, treat with Alcohol, which takes up the Emetine alone; which is to be obtained by evaporation. It appears in the form of transparent scales, of a reddish brown colour; nearly devoid of odour; taste bitter, but not nauseous; deliquescent, and unchangeable in boiling water.

The Emetine prepared by the above method, although sufficiently pure for medical purposes, is not wholly so. To obtain it pure, the brown Emetine is to be dissolved in water and treated with pure Magnesia, which takes up the free Gallic Acid, and combines with that in combination with the brown Emetine. Pure Emetine being nearly insoluble

in water, is precipitated with an excess of Magnesia; this magnesian precipitate is to be washed with a little ice-cold water, to separate the colouring matter, then treated with Alcohol, which dissolves the Emetine; evaporated, redissolved in a diluted acid, blanched with animal charcoal, and again precipitated by a salifiable base.

Pure Emetine is white pulverulent and unalterable by the air, scarcely soluble in water, but is readily dissolved by Ether or Alcohol. It manifests Alkaline properties; restoring the blue of Turnsol when reddened by an acid, combines with Acids without wholly neutralizing, and may be precipitated from its combinations with them by the Gall-nut.



It is stated by Majendie, that brown Emetine exhibited in the dose of one half to two grains, produces vomiting followed by profound and protracted sleep. In the dose of ten grains it occasions repeated vomitings, comatose sleep, and is followed by death in twenty four hours. Dissection, shows the whole Alimentary canal inflamed. The Lungs, inflamed and congested with blood. The same results, he states were obtained, when the medicine was injected into the veins, pleura, peritoneum, or cellular membrane.

When pure Emetine is used the dose is one half the dose of the brown Emetine.

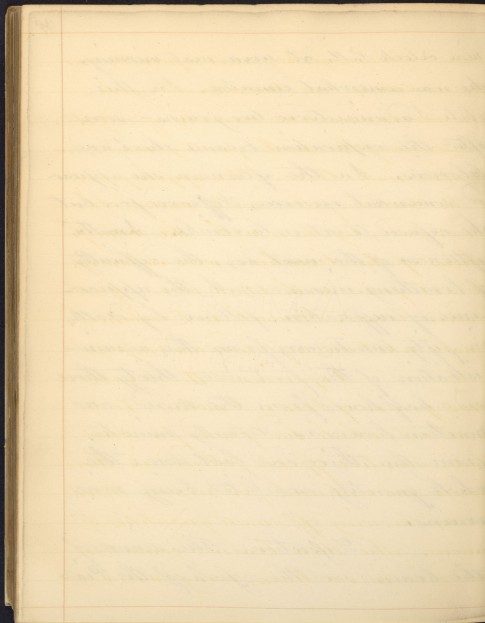
The object of the present
work is to present a full and
complete history of the
republic of the United States
from its origin to the
present time. It is a history
of the people, of their
actions, of their sufferings,
of their triumphs, and of
their progress. It is a history
of the great principles of
justice, of liberty, and of
equality, which have been
the foundation of the
American Republic.

The following experiments, made with brown Emetine (prepared in the Laboratory of Lauguella) are submitted as illustrative of its effects.

Experiment I. I gave five grains of brown Emetine (to a small cat;) made into a pill with bread, she had eaten heartily about four hours previous; in one hour she vomited three times, throwing off a large quantity of half digested food, efforts to vomit continued, throwing off small quantities of mucus. I examined the matter ejected but did not discover any portion of the medicine. About two hours after I gave two grains in solution, which produced vomiting in ten minutes, throwing off about a drachm of mucus coloured with the Emetine; this was at

nine o'clock P.M., at seven next morning, she was somewhat comatose. In this state I administered two grains - soon after the respiration became short and laborious. In the afternoon she appeared somewhat recovered, I offered food but she refused to eat or to drink. In the afternoon of the next day, the difficulty of breathing increased with the appearance of suffocation; followed by death, in fifty one hours, from the administration of the first dose; thirty three and a half hours from the second, and nineteen hours and twenty minutes, from the third and last dose: the whole quantity exhibited being nine grains.

Dissection. The sinuses of the brain; and the vessels of the Pia-



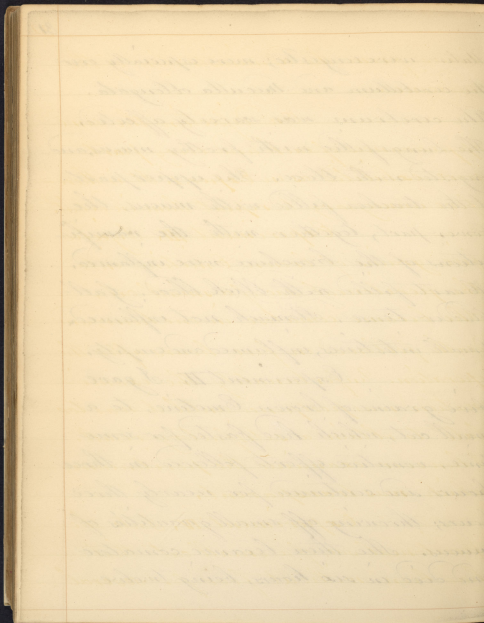
Matter were congested; more especially over the cerebellum and Medulla oblongata.

The cerebrum was scarcely affected.

The Lungs filled with frothy mucus, and congested with blood. The upper part of the trachea filled with mucus, the lower part, together with the ramifications of the bronchiae were inflamed.

Heart filled with black blood. Gall-Bladder tense. Stomach not inflamed. Small intestines, inflamed and empty.

Experiment III. I gave five grains of brown Emetine, to a small cat, which had fasted for some time, vomitive efforts followed in three hours and continued for nearly three hours; throwing off small quantities of mucus. She then became comatose and died in six hours, being twelve

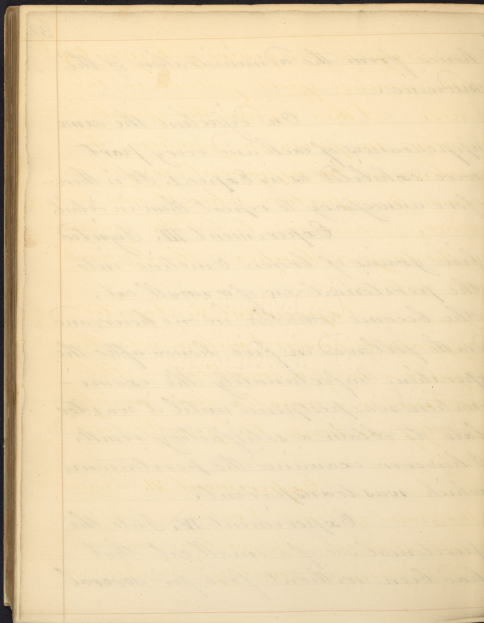


hours from the administration of the medicine.

On dissection the same appearances of each and every part were exhibited as in Experiment I. It is therefore unnecessary to repeat them in detail.

Experiment III. Injected five grains of brown Ometine into the peritoneal sac of a small cat. She became comatose in one hour, and death followed in five hours after the operation. Unfortunately the examination was postponed until it was too late to obtain a satisfactory result. I however examined the peritoneum, which was transparent.

Experiment IV. Into the peritoneal sac of a small cat that had been without food for several



hours, I injected two grains of brown Emetine, vomitive efforts followed in two hours. I then divided the spinal marrow, and found on dissection, the peritoneum transparent, except around the aperture where it was reddened. There was but little mucus in the lungs or trachea. The Stomach was natural.

Experiment V. I injected one grain of brown Emetine into the jugular vein of a small cat. She remained in a comatose state nearly twenty four hours, but finally recovered.

Experiment VI. I injected two grains of brown Emetine into the plicura of a small cat. In one hour and a half it produced vomiting. In this case

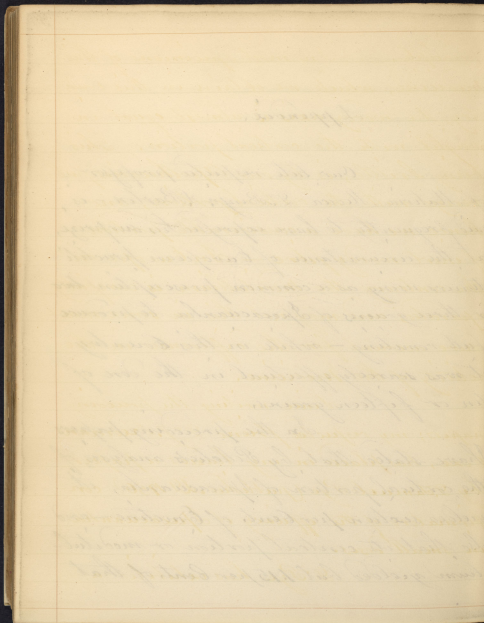
the prostration of strength was extreme. She became comatose and died in thirty-one hours.

Dissection. The sinuses of the brain and the vessels of its meninges were very much congested with blood. The Lungs were much inflamed and congested. Heart filled with black blood.

Appendix.

Our late respected professor of Materia Medica Dr. Benjⁿ. Barton - is said frequently to have expressed his surprise, at the circumstance of European practitioners using as a common prescription two or three grains of *Specacuanha* to produce full vomiting - while in this Country it was scarcely effectual in the dose of ten or fifteen grains.

In the preceding papers I have stated that by Pelletier's analysis of the cortical portion of *Specacuanha*, it yielded sixteen per Cent. of Emetine - and also that its central portion or medullum yielded but 1.15 per Cent. of that



principle. In most specimens of this medicine, which we obtain in this country, the woody axis is almost equal in weight with the cortical portion. This being brittle, is by our Apothecaries pulverized with the cortical portion; and hence we have a considerable portion of inert woody fibre — In Europe on the contrary the Medullium is carefully separated; and may not this in some measure account for the difference in the activity of the medicine.

Since writing the preceding papers; my respected friend Dr. J. Reoman Coxe, has placed in my hands a paper by Dr. Samuel Pyle (published AD 1756) confirmatory of the efficacy of Spicacuanha in small doses.

Dr Pyle has exhibited a

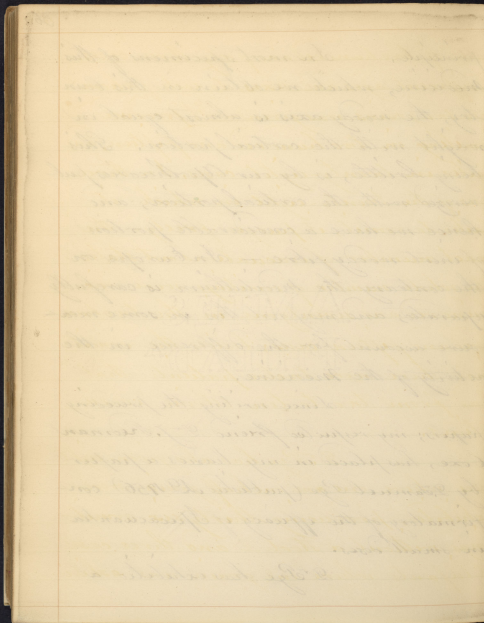
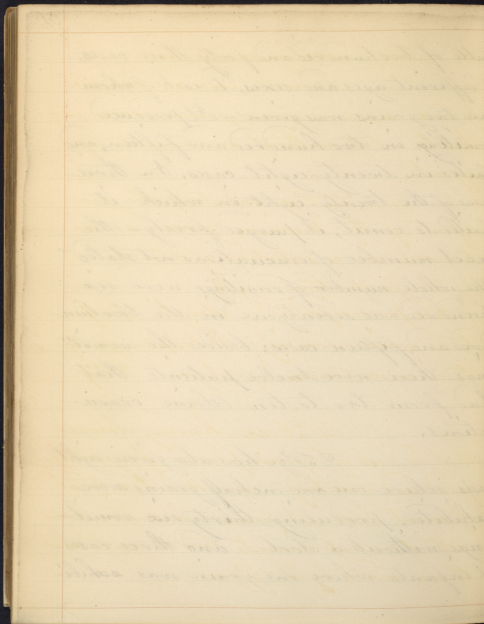


table of two hundred and forty three cases, of different ages and sexes, to each of whom only two grains was given - It produced vomiting in two hundred and fifteen, and failed in twenty-eight cases. In three cases of the twenty-eight in which it failed to vomit, it purged freely - the exact number of evacuations not stated. The whole number of vomitings were six hundred and seventy one in the two hundred and fifteen cases; besides the vomitings, there were twelve patients that had from two to ten alvine evacuations.

D^r Pyc has also given eight cases where one and one half grains were exhibited, producing thirty six vomitings without a stool - and three cases of infants where one grain was exhibi-



ted without vomiting or stools.

Several cases are reported where three or four grains were exhibited - but without an increase of effect.

Dr. Pye mentions the good effects of the medicine given as an Enema in a solution of Starch

The proportions
of this prescription
to be varied according
to circumstances.

{	<p><i>R</i> Amyli ʒj or ʒ Pulv. Specac. grs viij Aqua ʒviij</p>
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Dr. Boze having observed that a dose of Dover's powder frequently produced vomiting - was lead to a trial of small doses of Specacuanha - The result of his experiments, tend to confirm those made by Dr. Pye.

